Message

From: Zakrzwski, Diana [zakrzwdl@dhec.sc.gov]
Sent: 10/17/2018 11:11:31 AM
To: Bloeth, Mark [Bloeth.Mark@epa.gov]; Modak, Nabanita [Modak.Nabanita@epa.gov]; Ayres, Sara [Ayres.Sara@epa.gov]
CC: Humphries, Diane [HUMPHRDM@dhec.sc.gov]
Subject: Process Description for call at 8:30 am

Here is the process description of the facility to be discussed as written in the construction permit application:

The pyrolysis materials reduction technology consists of a two stage process, with the first stage being an indirect fired reactor where the materials to be thermally destroyed are fed into an internal chamber free
of any added air, and the heating process takes place in an external shell which prevents comingling of the burner exhausts with the material decomposition gasses. The process is continuous, whereby the materials to be destroyed are first particle size reduced (in case they are solids), and then continuously fed into the system at controlled rates.

The first stage (primary system) consists of six Eclipse Model TJ075, ignition burners, natural gas fired, 750,000 BTU/h maximum heat input rate each, with electronic spark ignited pilot. The pyro gas is transferred with a 2,000 cfm capacity, 15 HP, transfer fan. The typical operating temperature range for this system is expected to be approximately 1200 'F.

Thermal breakdown of materials from the first stage results in the formation of "gaseous byproducts", or what is more commonly referred to as "pyro gas". This pyro gas consists of a number of breakdown components, and generally has a calorific value. Or in other words, in this system high molecular weight hydrocarbons are "cracked" or broken down into low molecular weight VOC's (pyro gas). The short chain or low molecular weight VOC's are much more easily destroyed in the indirect fired thermal oxidizer.

The second stage indirect thermal oxidizer consists of a hollow chamber heated with a 2,000,000 BTU/h burner,
which is used to drive the primary conversion of the pyro gas to carbon dioxide and water vapor. The typical operating temperature range for the thermal oxidizer is expected to be from 815C (1,500F) to 980C (1,80OF).

The controlled feed of the solid materials into the first stage results in a constant flow of pyro gasses into the thermal oxidizer, and the subsequent destruction of the pyro gas. Due to the quiescent nature of the system there are no turbulent or high energy flows capable of entraining particulate matter through the system resulting insignificant particulate matter emissions. The utilities required for operation are natural gas or liquid propane and three phase 480 volt electrical power supply (100 Amp circuit).

The emission point is a stack with rectangular design, dimensions of 4 ft wide by 6 ft long and an area of > 3,000 square inches. Total stack flow rates are expected to be 5,000 CFM with linear velocities of 3.5 ft per second. The stack height is designed to sit three feet above the roof line of adjacent buildings.

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